

AMENDMENTS TO THE CLAIMS

This listing of claims replaces all prior versions, and listings, of claims in the application.

1. (Currently Amended) A blower comprising:

an impeller having an outer diameter and a plurality of axial flow blades, the axial flow blades being mounted at circumferential intervals on an outer peripheral surface of a boss; and

a bell mouth having an opening with an inner diameter, the bell mouth being generally coaxial with the impeller and cylindrically constricted to guide gas to the impeller, wherein

the inner diameter of the bell mouth is in a range from 50% to 85% of the outer diameter of the impeller, and

an inner face of a constricting portion of the bell mouth, extending from a wider, expansion diameter side of the bell mouth to a narrower, reduction diameter side of the bell mouth, has a curved surface spaced apart from a rotational axis of the impeller by a distance that is circumferentially uneven.

Claims 2 and 3 (Cancelled).

4. (Currently Amended) A blower comprising:

an impeller having an outer diameter, rotating about a rotational axis, and including a plurality of blades, the blades being mounted at circumferential intervals to an outer peripheral surface of a boss of the impeller; and

a bell mouth having an opening with an inner diameter, the bell mouth being generally coaxial with the impeller and cylindrically constricted to guide gas to the impeller, wherein

~~the inner diameter of the opening of the bell mouth is smaller than the outer diameter of the impeller, and~~

a peripheral portion of each blade has a tip, and part of each tip is disposed directly opposite the bell mouth and extends beyond the opening of the bell mouth along a direction parallel to the rotational axis of the impeller, toward the bell mouth, and

the inner diameter of the opening of the bell mouth is smaller than the outer diameter of the impeller at the part of each tip which is disposed directly opposite the bell mouth and extends beyond the opening of the bell mouth along a direction parallel to the rotational axis of the impeller, toward the bell mouth.

5. (Previously Presented) The blower according to Claim 4, wherein,

when the blades of the impeller are projected onto a plane perpendicular to the rotational axis of the impeller, then each of curves formed by connecting center points of arc lengths of circumferentially extending arcs, formed through overlapping of concentric circles, which radially extend around an intersection point of the plane and the rotational axis, and the projected blades, is defined as a circumferential center curve,

an angle made between a straight line connecting the intersection point and a boss-side end point of the circumferential center curve and a straight line connecting the intersection point and an arbitrary point in the circumferential center curve is defined as a forward angle θ , with a rotating direction of the blades taken as positive,

a change ratio per unit radial length of the forward angle θ is defined as an advance ratio, and

each blade has, in a radial direction, a sweepforward wing portion which is on a boss side and which exhibits a positive value of the advance ratio, and a sweepback wing portion which is on an outer peripheral side of the blade and which exhibits a negative value of the advance ratio, with the arc length of each blade increasing from the boss side toward the outer peripheral side.

6. (Previously Presented) The blower according to Claim 5, wherein a portion of the sweepback wing portion protrudes from a reduction diameter side of the bell mouth toward an expansion diameter side of the bell mouth in a direction along the rotational axis of the impeller.

7. (Currently Amended) ~~The A blower according to claim 1 comprising:~~
an impeller having an outer diameter and a plurality of axial flow blades, the axial flow blades being mounted at circumferential intervals on an outer peripheral surface of a boss; and

a bell mouth having an opening with an inner diameter, the bell mouth being generally coaxial with the impeller and cylindrically constricted to guide gas to the impeller, wherein the inner diameter of the bell mouth is in a range from 50% to 85% of the outer diameter of the impeller, wherein,

when the blades of the impeller are projected onto a plane perpendicular to the rotational axis of the impeller, then each of curves formed by connecting center points of arc lengths of circumferentially extending arcs, formed through overlapping of concentric circles, which radially extend around an intersection point of the plane and the rotational axis, and the projected blades, is defined as a circumferential center curve,

an angle made between a straight line connecting the intersection point and a boss-side end point of the circumferential center curve and a straight line connecting the intersection point and an arbitrary point in the circumferential center curve is defined as a forward angle θ , with a rotating direction of the blades taken as positive,

a change ratio per unit radial length of the forward angle θ is defined as an advance ratio, and

each blade has, in a radial direction, a sweepforward wing portion which is on a boss side and which exhibits a positive value of the advance ratio, and a

sweepback wing portion which is on an outer peripheral side of the blade and which exhibits a negative value of the advance ratio, with the arc length of each blade increasing from the boss side toward the outer peripheral side.

Claim 8 (Cancelled).

9. (Previously Presented) The blower according to Claim 7, wherein a boundary between the sweepforward wing portion and the sweepback wing portion substantially coincides with the inner diameter of the bell mouth.

10. (Previously Presented) The blower according to Claim 7, wherein a boundary between the sweepforward wing portion and the sweepback wing portion is situated outside of the inner diameter of the bell mouth.

11. (Previously Presented) The blower according to Claim 7, wherein diameter of the boundary has a ratio to the inner diameter of the bell mouth ranging from 80% to 130%.

12. (Previously Presented) The blower according to Claim 11, wherein the ratio ranges from 100% to 110%.

13. (Previously Presented) The blower according to Claim 7, wherein an inner face of a constricting portion of the bell mouth, extending from a wider expansion diameter side of the bell mouth to a narrower, reduction diameter side of the bell mouth, has a curved surface spaced apart from the rotational axis of the impeller by a distance that is circumferentially uneven.

14. (Previously Presented) A blower comprising a boss and a plurality of blades mounted at circumferential intervals to an outer peripheral surface of the boss, wherein,

when the blades of the impeller are projected onto a plane perpendicular to the rotational axis of the impeller, then each of curves formed by connecting center points of arc lengths of circumferentially extending arcs, formed through overlapping of concentric circles, which radially extend around an intersection point of the plane and the rotational axis, and the projected blades, is defined as a circumferential center curve,

an angle made between a straight line connecting the intersection point and a boss-side end point of the circumferential center curve and a straight line connecting the intersection point and an arbitrary point in the circumferential center curve is defined as a forward angle θ , with a rotating direction of the blades taken as positive,

a change ratio per unit radial length of the forward angle θ is defined as an advance ratio,

each blade has, in a radial direction, a sweepforward wing portion which is on a boss side and which exhibits a positive value of the advance ratio, and a sweepback wing portion which is on an outer peripheral side of the blade and which exhibits a negative value of the advance ratio, with the arc length of each blade increasing from the boss side toward the outer peripheral side,

a straight line extended from a center point of a height taken along a direction of the rotational axis, at a portion of each blade in contact with the boss, to an outer peripheral portion of the blade, perpendicular to the rotational axis, is defined as a straight line V,

a line obtained by connecting center points of the height in the direction of the rotational axis, at each radial of the blade is defined as a radial direction center line Z,

a line connecting the center of the height of each blade at the boss and an arbitrary point in the radial direction center line Z is defined as a straight line Y, and

the straight line Y is inclined toward a gas suction side with respect to the straight line V.

15. (Previously Presented) The blower according to Claim 14, wherein, in the circumferential center curve of the sweepforward wing portion, an angle of inclination of a tangent to the circumferential center curve increases gradually and toward a gas discharge side as the circumferential center curve extends from the boss side toward a boundary portion side, and

the angle of inclination of the tangent to the circumferential center curve increases gradually and toward a gas suction side as the circumferential center curve extends from the boundary portion side toward the outer peripheral side.

16. (Previously Presented) The blower according to Claim 14, wherein the sweepback wing portion of each of the blades has an advance ratio ranging from $-2.0^{\circ}/\text{mm}$ to $-2.9^{\circ}/\text{mm}$.